FOLIA MEDICA CRACOVIENSIA
Vol. LVIII, 2, 2018: 67–76
PL ISSN 0015-5616
DOI: 10.24425/fmc.2018.124659

Optic nerve disc veins inflammation (papillophlebitis) — case report

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Abstract: Papillophlebitis is an uncommon disease in clinical practice. We would like to present a case of a 29-year-old patient with atypical orbital pain and flashings, presenting relative afferent pupillary defect and already typical of the disease entity: ophthalmoscopic picture of the fundus and big blind spot in perimetry. We present a complex and interdisciplinary diagnostic process that excludes general diseases such as hypertension, diabetes, coagulation disorders and neurological causes. We leave the only identifiable abnormality and potential source in the inflammatory process of periodontal inflammation and sinus jaw changes. We also describe the process of remitting the changes and finally a favorable end result of the primarily a very disturbing clinical picture that this disease may present.

Key words: papillophlebitis, papilloedema, central retinal vein occlusion.

Introduction

Inflammation of the optic nerve disc veins (papillophlebitis) is not a fully explained ailment of suspected vascular inflammatory origin [1]. An inflammatory condition within the veins of the optic disc constitutes a suggested cause of this disease entity, however, the source itself is unclear and it can be isolated inflammation of the optic disc or optic disc vessels themselves [2]. Symptomatically, the disease may cause a mild reduction in visual acuity [3, 4], occasionally also photopsies [5]. Taking into account

the signs — ophthalmoscopically, an inflammation of the optic disc veins is manifested in optic disc swelling and/or vein occlusion signs [2] and — in perimetry — widening of the blind spot [3, 4] is observed. Significant features include a frequently mild course and a self-limiting character. Papillophlebitis is not associated with any concomitant general disease, however, hypertension was detected in 23–42% of the patients and diabetes was found in 3–9% of the patients suffering from this disease entity. Also, comparison with other people in the same age groups did not show any differences in hyperlipidemia and increased blood clotting and viscosity [6]. However, available publications first recommend diagnostics of the possible causes of hypercoagulability, hypertension, hyperlipidemia, atherosclerosis, diabetes, autoimmune diseases and diagnostics for thrombophili, such as: the factor V Leiden mutation, B6 vitamin deficiency, folic acid deficiency, hyperhomocysteinemia as well as protein C and protein S deficienc [3, 4]. Therefore, relative similarity and necessity of differentiation of this disease unit with central retinal vein occlusion (CRVO), a disease with a similar clinical picture, but occurring in another age group (most often in the patients over 50 years of age) and in another pathomechanism [3] arise. In the therapeutic and diagnostic process of patients suffering from papillophlebitis, close observation is important since — unfortunately — as many as 30% of the patients can develop severe ischemia and take the picture as in the ischemic form of CRVO [2], which confers adverse prognosis of the final function of the eye and may lead to the development of neovascular glaucoma [2, 7].

The objective of the study is to present a rare case of papillophlebitis with atypical presentation in medical history taking and physical examination, a clearly disturbing primary picture and — finally — a good topical condition after conservative treatment.

Case study

A 29-year-old female patient was referred to our hospital with a diagnosis of the left optic disc swelling. The patient did not experience visual deterioration and the predominant discomfort that prompted the patient to visit an ophthalmologist was non-localized, continuous dull pain of the left eyeball lasting for several days that did not intensify with eye movements, with the sensation of flashing and accompanying headache. The pain subsided after administration of oral non-steroidal anti-inflammatory drugs, yet, it quickly returned after their effects had disappeared (4–6 hours after taking the tablet). The patient has not been treated ophthalmologically so far, with a negative family medical history, generally taking only levothyroxine due to hypothyroidism (in the results of the study — supplementary euthyreosis). Additionally, in the medical history, condition after healed ureaplasmic inflammation of the urinary tract and in the course of root canal treatment. The visual acuity on the Snellen eye charts in both eyes was 1.0 in the distance test and 0.5 in the near test without correction. In the physical examination, colour vision deficiencies were not detected in the Ishihara test, intra-ocular pressure was

normal. The presence of the relative afferent papillary defect on the left side was alarming. Ophthalmologically, visible swelling of the optic disc with its blurred boundaries and preserved recess, a poor amount of retinal petechiae, mainly in the peripapillary location, vascular arches and single ones at the distant circumference, significant tortuosity and widening of venous vessels and single soft exudates — "cotton wool spots" (Fig. 1).

Repeated examination of the static visual field maintained an enlarged blind spot in the left eye (Fig. 2).

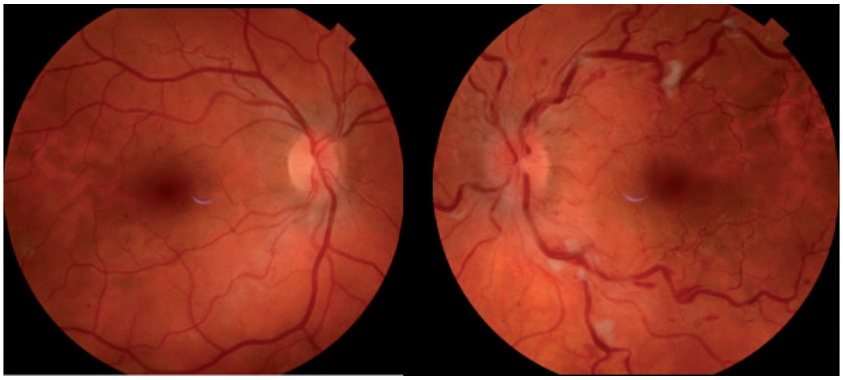

Fig. 1. Fundus of both eyes at the beginning of the observation.

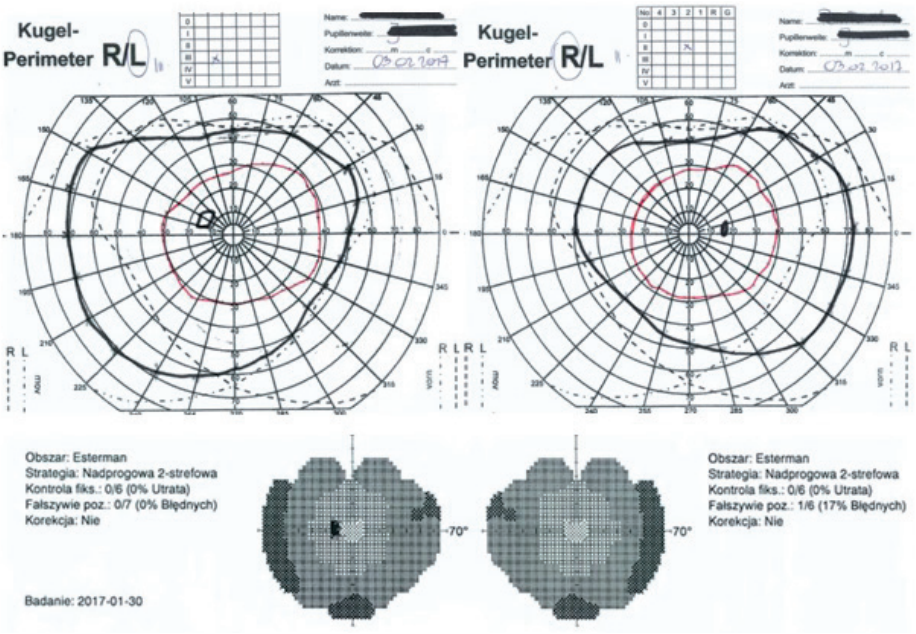

Fig. 2. Initial perimetry with blind spot enlargement in left eye.

Fluorescein angiography confirmed prolonged arterio-venous flow and delayed leakage in the vicinity of the large vessels and optic disc. In the OCT examination, there was swelling of the optic disc and adjacent retina with maximal thickening — swelling of the retina adjacent to the large vessels. We also observed thickening of the central retina in the left eye –281 μm, without intra-retinal fluid spaces (Fig. 3, 4).

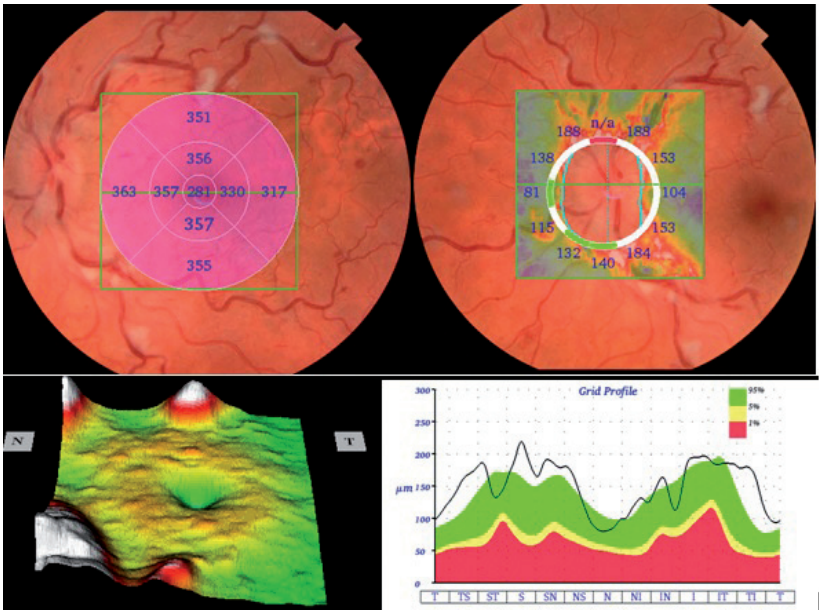

Fig. 3. Initial OCT of left eye showing optic disc swelling and thickening of the macula.

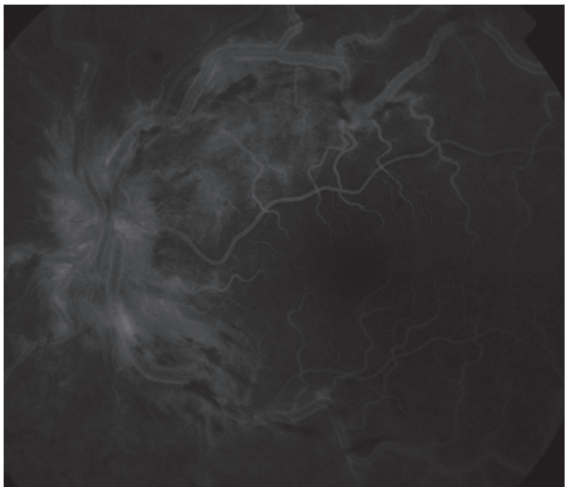

Fig. 4. Fluorescein angiography of the left eye.

General examination and monitored blood pressure, heart rate and ECG were normal. In the performed laboratory diagnostic tests, ESR and CRP, examined parameters of the coagulation system: D-dimers, fibrinogen, prothrombin time (PT) and activated partial thromboplastin time (APTT) as well as homocysteine levels were normal. Other tests: electrolytes (sodium, potassium, calcium), morphology, lipid profile, thyroid parameters, B12 vitamin level, folic acid and D3 vitamin were normal. Potential possible causes of infection, such as: tuberculosis, syphilis, Lyme disease and toxoplasmosis were also excluded. The only abnormal result was the positive ANA on HEP 2 cells in the granular illumination type in the titre of 1:10,000, which prompted us to transfer the patient for further diagnostics within the the immunological and rheumatological outpatient clinic — there were no specific anti antibodies detected: nRNP, Sm, SS-A, Ro-52, SS-B, Sxl-70, PM-Scl, Jo-1, B-centromere, PCNa, ds-DNA, nucleosomes, histones, ribosomal P-protein, AMA-M2, DFS70 and diagnostics was completed without a diagnosis of the autoimmune disease. The performed MRI of the eye sockets excluded focal and inflammatory lesions in the orbital structures, particularly suspected perineuritis. Its confirmation could be tram-track signs or 'sheath' fascicle [8] in the MRI of the optic nerve, however, none of them was detected. The neurological diagnostics conducted at the neurological department and diagnostic imaging test performed there — CT examination and MRI of the head did not demonstrate focal and inflammatory changes and the only abnormality was a cyst of the right maxillary sinus. For this reason, the patient underwent a laryngological consultation where no abnormalities and a causal relationship with the ophthalmological condition were found and the patient was qualified for planned excision of the lesion in the sinus. In the performed chest imaging, only widening of the cardiac silhouette was found and after general medicine consultation, the patient was referred for cardiological diagnostics where — following the transoesophageal echocardiography — suspected abnormalities, including a persistent oval foramen — were excluded.

In the extended diagnostics performed by coagulation disorder treatment outpatient clinic, the presence of the Leiden V mutation, prothrombin 20210A mutation or the presence of the lupus anticoagulant, anti-beta2 glycoprotein I antibodies and anti-cardiolipin antibodies were not detected. The values of the protein C, free protein S and antithrombin were maintained within the norm, which ruled out possible hypercoagulation diseases. The patient was also referred to the Maxillo-Facial Surgery Outpatient Clinic where it was recommended to continue the dental treatment of 3 teeth (including the one on the left side — identical to the affected eye) being the potential focal points of the inflammation. Finally, active periodontal inflammatory foci constituted the sole perceptible cause of the topical condition and they seem to be a potential starting point. Broadened diagnosis,

a number of consultations, a lack of any apparent causes of the coagulation disorders, widening of the blind spot in perimetry typical of papillophlebitis, active periodontal inflammatory foci and progressive withdrawal of the ocular lesions during the observation prompted us to diagnose the inflammation of the optic nerve veins with orbital pain and untypical — in the current descriptions — RAPD sign.

Hospitalization at our department also included the initial short-term empiric therapy- dexamethasone and ceftriaxone which were administered intravenously and long-term administration of acetylsalicylic acid in the dose of 75 mg orally and nepafenac with dexamethasone locally. For the whole period of observation/recession of the disease process, we maintained nepafenac locally with the intention of macula protection, anti-inflammatory and potentially anti-aggregative action with generally administered acetylsalicylic acid in the dose of 75 mg as an anti-aggregation agent (which resulted from the internal medicine recommendations).

Results

The first favourable prognostic symptom was — symptomatically — subsiding of pain ailments of the eyeball and — taking into account the signs — resolution of soft exudations — "cotton wool spots" with a decreased amount of retinal petechiae, which was observed after about three weeks. Then, retinal swelling was maintained at a relatively unchanged level in the OCT examination. Significant improvement was the period of the next two months of observation with gradual complete resolution of retinal edema to the symmetrical values with another eye, complete resolution of petechiae, a symptom of the optic disc edema and tortuosity with widening of the venous vessels and — subjectively — the sensation of flashes also disappeared (Fig. 5, 6, 7).

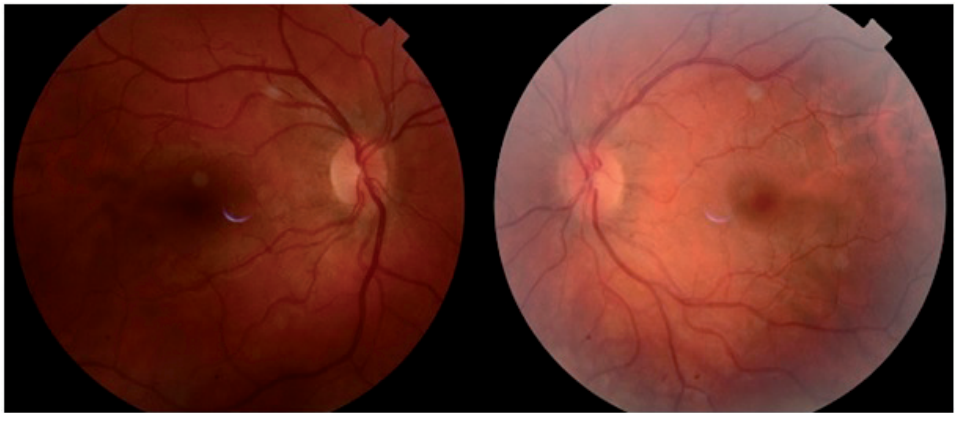

Fig. 5. Fundus of both eyes after 3 months observation showing regression of local symptoms in left eye.

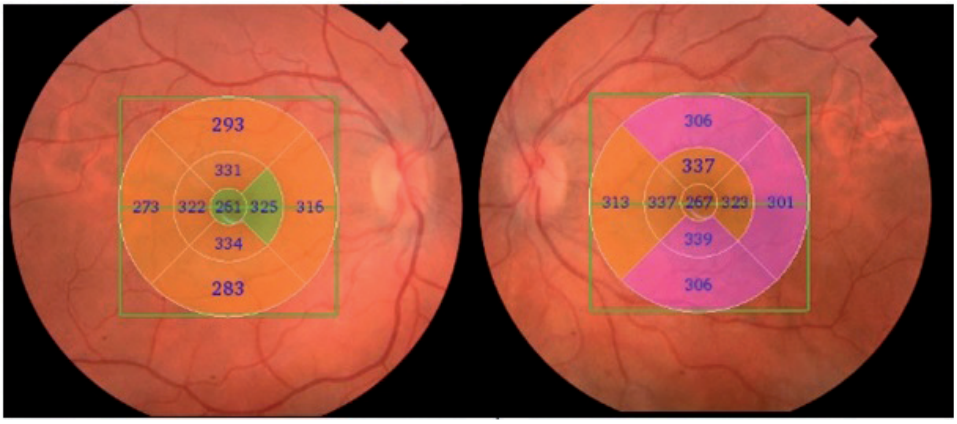

Fig. 6. OCT of maculas in both eyes after 3 months observation.

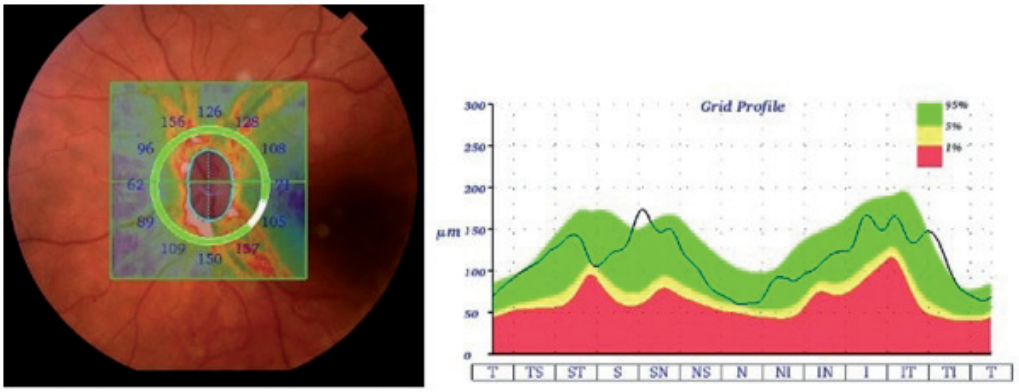

Fig. 7. OCT of left optic disc after 3 months observation.

The final expected result was the improvement of the visual field, both in the static and kinetic examination. The patient is under the care of our centre and in the course of dental treatment (Fig. 8).

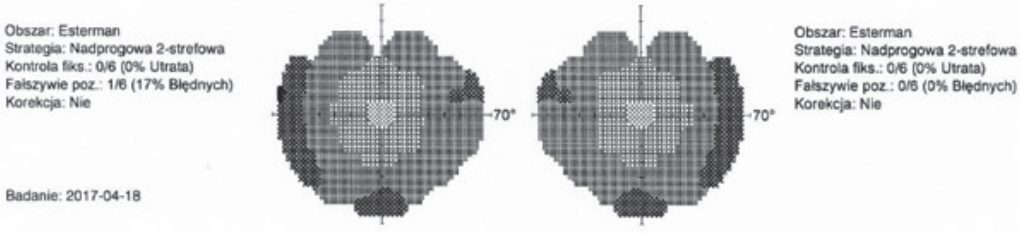

Fig. 8. Final, correct perimetry.

Discussion

In the clinical literature, papillophlebitis is described as a rare disease. In the PubMed database from the sixties of the 20th century, there are several dozen works covering the scope of this unit where there is just a dozen ones from the last decades discussing the treatment of the inflammation of the optic disc veins. Publications concerning papillophlebitis are of casuistic nature. Differentiation of this ailment is also intriguing as the inflammation of the optic nerve veins is often compared to the CRVO in young patients [1, 9–11], without placing a clear boundary. Taking into account the symptoms, the most common one that is usually reported is a mild condition, often imperceptible in the physical examination — on the Snellen charts, decreased visual acuity [9, 11, 13, 14] that may correspond to the clinical picture of the macula (edema) [11]. Ophthalmoscopically in papillophlebitis, the following are described: swelling, blurred borders of the optic disc [9, 11, 14], retinal petechiae [9, 13, 14], vasodilation [11, 13, 14] and soft exudates [9]. The prominent common feature observed in perimetry and also in our patient is an enlargement of the blind spot [9, 11, 15], hence the current interchangeable term "big blind spot syndrome" [15]. In the laboratory tests, particularly in the coagulation parameters, as in our case, deviations [11, 14] are usually not observed, similarly the inflammation indicators monitored from blood remain within the normal range [9, 14], however, they may also be increased [13]. In the available publications, we did not meet symptomatic orbital pain, flashes and the present symptoms of RAPD. All these symptoms forced us to conduct broaden and interdisciplinary diagnostics. The pain itself, although it is present in the inflammation of the optic nerve [16], is not described in the inflammation of the optic nerve veins (papillophlebitis). There are reports that the orbital pain is absent in the inflammation of the optic nerve head — only ischemic pain is to occur in this location and typical optic nerve pain involves inflammation in the extra-ocular nerve segment and their observed frequency increases with the inflammatory condition located closer to the orbital peak [14]. Diagnostic imaging and exclusion of inflammation, including perineuritis abolished the need for general steroid therapy, which is justified in this unit [17], and not necessarily in papillophlebitis. The treatment of the optic venous inflammation involves close observation and progression-dependent management as well as it may be based on steroids in the event of a significant or persistent decrease in the visual acuity. Unfortunately, the benefits of oral or intravenous administration of the steroids have not been confirmed [10, 18]. In addition, the prothrombotic effects of systemically administered glucocorticoids appear to be potentially hazardous. There are scarce reports of the use of anticoagulants, however, the benefits of using them are not revealed here, neither [12]. Macular edema arising in the pathomechanism similar to CRVO can potentially be treated in the same way — e.g. with the application

of anti-VEGF preparations administered intra-vitreally [11], however, reports are extremely scarce. What is more, empiric antibiotic therapy resulting from the mechanism-pathophysiology of the disease and constituting an attempt at reacting in difficult cases [11] also appears in the treatment descriptions as an auxiliary. The previously undeveloped treatment algorithm should be based on time observation and dynamic adaptation of therapy to current needs resulting from changes in the local condition.

Conclusions

Diagnosis of papillophlebitis requires complex diagnosis and exclusion of numerous general diseases as well as meticulous search for a potential outbreak of inflammation. In our case, we have covered a long way to eliminate all potential causes of papillophlebitis as well as orbital pain, flash symptom and observed signs of the long-term persistent RAPD atypical of this unit. The correlation between ocular lesions with the lesions in the maxillary sinus and periodontal inflammation whose treatment lasted for a few months after leaving our ward is intriguing. For our patient, the condition was limited to general administration of acetylsalicylic acid and topical one of nepafenac in the conservative treatment. The question whether such treatment was effective remains unanswered.

Conflict of interest

None declared.

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